Approved For Release 1999/09/21 : CIA-RDP79T00935A000100100001-2

CENTRAL INTELLIGENCE AGENCY 425301

30 January 1951

INTELLIGENCE MEMORANDUM NO. 350

SUBJECT: Vulnerability of the Tantalite and Columbite Industry in Nigeria

1. Development of the Industry.

General.

The tantalite and columbite of Nigeria are associated with tin and are mined from some 35 scattered deposits. The deposits are all open placers with about 20 feet of overburden. Introduction of Kipp Kelly Air Float separators (for concentrating ore) has rendered possible production from areas of lower grade ore which previously were not regarded as being economic to utilize. Water is very scarce and limits the use of wet methods of concentration. Although the country is open and prospecting is not difficult, a material increase in production can hardly be effected because of the limitations. Mining methods are simple and fairly primitive, and the concentration is accomplished by small scattered units.

The production of tantalite in Nigeria centers in the Egbe area in Kabba Province. Formerly, tantalite was derived from tin tailings, but it is currently being extracted from alluvial deposits. Nigerian columbite comes chiefly from the Jos area of Plateau and Bauchi Provinces, as a by-product of tin operations. Approximately 1 ton of columbite is produced for each 7 tons of tin. Scattered pockets of pegmatite containing columbite and tantalite are found in several of the northern provinces.

The two largest producers of tantalite are the Hamber and Paravicini interests operating in the Egbe area, but six companies near Lamba, Plateau Province, produce smaller quantities. The total Nigerian production of tantalite through 1947 amounted to slightly more than 20 long tons. About 1.30 long tons were produced in 1946 and 2 long tons in 1949. Known reserves of tantalite concentrates approximate 173 long tons.

The major producers of columbite are the Jantar Nigeria Company, Amalgamated Tin Mines of Nigeria, and the Bisichi Tin Company, but several

Note: This report, which has been prepared at the request of the Special Assistant for Intelligence, Department of State, on the basis of immediately available information, has not been coordinated with the intelligence organizations of the Departments of State, the Army, the Navy, and the Air Force. It contains information available to CIA as of 17 January 1951.

Approved For Release 1999/09/21 : CIA-RDP79T00935A000100100001-2

Approved For Release 1999/09/21 : CIA-RDP79T00935A000100100001-2

other concerns also produce significant quantities. In 1947, Nigerian production was 1,286 long tons, or 95 percent of the world's industrial needs. Production of columbite averages 1,000 long tons per year but was considerably higher during World War II. It is estimated that in 1950, 1,069 tons of columbite concentrates were produced, of which 418 were destined to the UK, and 651 tons to the US. The amount produced is closely associated with the relative prices of columbite and tin. High-quality reserves are estimated at slightly over 9,000 long tons and are located chiefly in the vicinity of Jos. The US company which purchases concentrates lists 32 producing companies with which it deals, of which only four produce over 100 tons of concentrates per year (1950 figures), only one produces between 50 and 100 tons per year, six produce between 10 and 50 tons per year, and the rest produce less than 10 tons per year each. The concentrates have comparatively small bulk, and a high value. Individual shipments are therefore small.

Electric Power.

Mining operations in the Jos area are dependent upon electricity supplied by three hydroelectric plants of the Nigerian Electricity Supply Corporation, owned by Amalgamated Tin. Dams supplying water for these plants are located at Kurra Falls, 29 miles southeast of Bukuru; at Tenti, 27 miles south of Bukuru; and at Kwall Falls, 14 miles east of Jos. The Kurra Dam, the largest of the three, and the Tenti Dam are constructed of laterite with wooden gates and concrete spillways.

Mining Equipment.

Equipment in use in mining operations includes bulldozers, hydraulic elevators, bucket dredges, draglines, scrapers, pumps, air compressors, and power shovels. Specialized equipment is used in dressing plants near the mine sits for tabling, floatation, and magnetic separation. Mine operation depends upon a supply of water which is usually obtained from a series of small dams near-by.

Railroads.

The government-owned Nigerian Railway has two main lines. A northeast-southwest line runs from Apapa to N'guru via Kaduna, Zaria, and Kano. The second line runs north from Port Harcourt and joins the other line at Kaduna Junction. A cutoff at Kafanchan serves the Jos area. Unlike tin, which is shipped to Port Harcourt, tantalite and most of the columbite are transported to Apapa (Port of Lagos), which is a port of call for a larger number of

Approved For Release 1999/09/21 : CIA-RDP79T00935A000100100001-2

Approved For Release 1999/09/21 : CIA-RDP79T00935A000100100001-2

American ships. The ore is shipped via the 3'6"-gauge railway from the Jos area to Apapa by way of Kafanchan and Kaduna Junction. Comparatively little ore is transported over the 2'6"-gauge line from Jos to Zaria. From the Egbe area tantalite is shipped by truck for a distance of some 50 miles to the railroad, probably at Offa, and thence by rail to Apapa. The railroads are single-track throughout, all locomotives are coal-fired, switches are manually operated, and train crews are native African. The efficiency of both crews and equipment is poor. Stations are protected by manual block signals on single or double wires. Repair shops are located in Zaria, Enugu, and Ebute. The Ebute shop near Apapa employs some 2,000 men. Lack of adequate passing facilities and shortages of locomotives, rolling stock, and spare parts are serious handicaps to efficient operation of the railway.

The track from Jos to Apapa crosses more than 100 streams. Three of them are crossed by railway bridges that also carry highway traffic -- the Zungeru bridge across the Kaduna River, 426 miles north of Apapa by rail, and the two bridges across the Niger at Jebba, 303 rail miles north of Apapa. On the line between Jos and Port Harcourt, there are 58 stream crossings, including several strategically important bridges. The most vulnerable are the joint highway-rail bridge across the Benue River at Makurdi, 288 miles north of Port Harcourt, and the rail bridge across the Ino River, 17 rail miles north of Port Harcourt. Bridges also cross the Mada River at points approximately 375 and 425 miles north of Port Harcourt.

Average running time between Jos and Apapa, 735 rail miles, is five days; that between Jos and Port Harcourt, 521 rail miles, is four days. The distance between Jos and Kano is 313 rail miles via Kaduna Junction and the Zungeru bridge across the Kaduna River and 221 miles via Zaria.

Highways.

The highway system of Nigeria is not adequate for a large volume of truck traffic. In the event of a railway failure, the highways could not be relied upon to take over the transport load. Although Jos is connected with both Lagos and Port Harcourt by all-weather roads, they are subject to washout during the May-October wet season. The 112-mile road between Lagos and Ibadan and the 50-mile stretch from Ibadan to Ife are paved. All other roads have earth or gravel surfaces. This includes the highway connections between Jos and Kano, a distance of 350 miles in the wet season which may in the November-April dry season by using secondary roads be cut to less than 200 miles.

Along the roads, culverts and small bridges are numerous, and bridges and ferries impose severe limitations on the speed and weight of vehicular traffic. At Jebba, 279 road miles north of Lagos, the main highway uses the two railway bridges for crossing the north and south channels of the Niger River. From 0630 to 1830 hours each day, these bridges are open to vehicular

Approved For Release 1999/09/21 : CIA-RDP79T00935A000100100001-2

Approved For Release 1999/09/21 : CIA-RDP79T00935A000100100001-2

traffic between trains. The Nigerian Railway limits gross vehicular weight to 4,400 pounds, maximum tread width to 5 feet 6 inches, and maximum height to 18 feet. Twenty miles west of Bida and 385 road miles north of Lagos, through traffic crosses the Kaduna River by a ferry operated by the Nigerian Marine Department. Approaches to the ferry are covered with wire matting, and the ferry itself is a raft poled across the stream. Between Jos and Port Harcourt are two large bridges. The Benue River Bridge at Makurdi is a concrete rail-highway bridge with no weight limits but with a height limit of 16 feet. A highway bridge crosses the Imo River 15 miles northeast of Port Harcourt. There are no bridges across the lower Niger River. Ferries at Onitsha (Asaba) and Lokoja are operated by the Nigerian Marine Department.

Air Transport.

Neither columbite nor tantalite is currently being exported from Nigeria by air. The airport at Lagos is used regularly by the British Overseas Airways Corporation (BOAC) and by Air France. Koninklijke Luchtvaart Maatschappij (KLM) and Sabena have regularly scheduled flights from Kano North Airfield. During World War II, some ore was flown out of this airport, and the export, particularly of columbite from the Jos area, might again become practical.

River Transport.

During the dry season the Niger River is navigable for craft with draft of less than 6 feet as far north as Jebba, and the Benue River is navigable well above Makurdi. Most river craft draw 4 to 6 feet of water, and the barges range in capacity up to 300 tons.

Coal.

Coal for the Nigerian Railway and 13 thermoelectric plants, including the key installation at Lagos, is furnished by the government mine at Enugu, 180 road miles and 151 rail miles north of Port Harcourt. Seven thousand men are employed at the Enugu mine. Of the production, which averages between 600,000 and 700,000 tons of coal per year, 365,000 tons go to the Nigerian Railway. Reserves of coal are estimated at 17 to 20 million tons. In recent years, shortage of machinery and labor unrest have reduced production.

Equipment at the mine site includes: an air compressor, a step-down transformer, mine telephone system, air-circulating system, public address system, repair shops, mine railway of 2-foot gauge, cable for mine cars, and a conveyer belt. Water is supplied by the Enugu waterworks and electricity

Approved For Release 1999/09/21 : CIA-RDP79T00935A000100100001-2

Approved For Release 1999/09/21 : CIA-RDP79T00935A000100100001-2

by the 3,400-kilowatt thermoelectric plant at Enugu. Coal is transported by rail to Port Harcourt, and from there by sea to Ijora Coal Wharf on Iddo Island at Lagos.

Water Supply.

Waterworks serve the larger settlements, including Enugu, Jos, Lagos, Port Harcourt, and Kano. In the Egbe area, water is supplied by springs and streams.

Ports.

Nigeria is served by two major ports. Lagos will take vessels up to 27-foot draft and can handle 26 ships at one time; Port Harcourt will take six ships with drafts up to 23 feet. No other ports have rail connections.

Although Lagos is an island without rail facilities, it is connected to Iddo Island by the 1,800-foot Carter Bridge. Iddo Island, on which the 13,750-kilowatt coal-fired power plant is situated, is linked by rail and highway with the mainland over the 750-foot Denton Causeway.

Rail sidings at Apapa Wharf on the mainland and at Ijora and Iddo Wharves on Iddo Island receive cargoes for inland destinations. Apapa has nine steel and concrete wharves varying in length from 160 feet to 1,400 feet, which are serviced by 11 electric cranes with capacities up to 25 tons; four steam cranes; and two floating cranes, in addition to a number of mobile cranes and lift buckets. Coal, oil, and diesel fuel are available at Apapa, and water may be taken on by pipe or tanker. Also available at this port are government slipways of 400-ton and 60-ton capacities, and a private slipway of 120-ton capacity.

At Port Harcourt there are only three mobile cranes of 3-ton capacity. Fuel oil, diesel fuel, water, and coal are available at the port. A bulk-storage oil plant is connected to tanker mooring buoys by pipelines.

Nigerian ports are now operating at full capacity, and rail and port facilities serving both Lagos and Port Harcourt are pressed to the limit under existing conditions. With an increase in port traffic, rail services would probably break down before port facilities.

Approved For Release 1999/09/21 : CIA-RDP79T00935A000100100001-2

Approved For Release 1999/09/21 : CIA-RDP79T00935A000100100001-2

Strategic Points.

a. Mining Operations.

(1) Dams for water supply.
(2) Pumps.
(3) Air compressors.
(4) Bulldozers.
(5) Scrapers.
(6) Hydraulic elevators.
(7) Bucket dredges.
(8) Drag lines.
(9) Power shovels.
(10) Special processing equipment.

b. Dams and Hydroelectric Plants with 10,000 kw. Total Capacity.

(1) Tenti Dam -- 27 miles south of Bukuru.
(2) Kurra Dam -- 29 miles southeast of Bukuru.
(3) Kwall Dam -- 14 miles east of Jos.

c. Thermoelectric Plants: 13 including --.

(1) Lagos, on Iddo Island -- 13,750 kw.
(2) Enugu -- 3,400 kw.
(3) Kano -- 1,570 kw.

d. Enugu Coal Mines.

(1) Enugu thermoelectric plant and power lines.
(2) Enugu waterworks.
(3) Air compressor for pneumatic drills.
(4) Mine railroad and cable.
(5) Conveyer belt.
(6) Step-down transformers -- 6,600 to 400 to 105 volts.
(7) Mine telephone system.
(8) Air-circulating system.
(9) Public address system (exact use not known).
(10) Repair shops.
(11) 18-volt generator.

e. Water Supply: 28 installations, including those serving --

(1) Lagos.
(2) Port Harcourt.
(3) Enugu
(4) Jos.

Approved For Release 1999/09/21 : CIA-RDP79T00935A000100100001-2

Approved For Release 1999/09/21 : CIA-RDP79T00935A000100100001-2

f. Railroad Equipment and Shops.

(1) Manual block signals protecting stations.
(2) Manual switches.
(3) Repair shops at Enugu, Zaria, and Ebute.
(4) 26 running sheds scattered throughout the system.

g. Railway Bridges.

(1) Jebba — 303 rail miles north of Apapa (Port of Lagos); two bridges crossing the north and south channels of the Niger, respectively.
(2) Zungeru — 426 rail miles north of Apapa; crosses the Kaduna River.
(3) Kaduna — 562 rail miles north of Apapa; crosses Kaduna River between Kaduna Junction and Kaduna.
(4) Makurdi — 288 rail miles north of Port Harcourt; crosses the Benue River.
(5) Eno River — 17 rail miles north of Port Harcourt, crosses Eno River.
(6) Mada River — between Makurdi and Kafanchan.
(7) Jos to Apapa — more than 100 stream crossings.
(8) Jos to Port Harcourt — more than 58 crossings.
(9) Railway system - 289 bridges, 18 of which are truss type and the remainder plate girder.

h. Highway Bridges.

(1) Jebba — highway uses rail bridges; maximum gross capacity 4,400 pounds, maximum tread width 5 feet 6 inches.
(2) Zungeru — highway uses rail bridge; maximum gross capacity 128,000 pounds, maximum tread width 7 feet.
(3) Kaduna — highway uses rail bridge; maximum gross capacity 6,000 pounds, maximum tread width 5 feet 7 inches.
(4) Makurdi — highway uses rail bridge; no weight limit.
(5) Eno River — highway bridges 15 road miles north of Port Harcourt; capacity not known.
(6) Bako River — approximately 10 miles east of Bida.

i. Highway Ferries.

(1) Kaduna River Ferry 15 miles west of Bida.
(2) Niger River Ferry at Onitsha, approximately 60 road miles west of Enugu.
(3) Niger River Ferry at Lokoja, at the junction of the Niger and Benue Rivers.

Approved For Release 1999/09/21 : CIA-RDP79T00935A000100100001-2

Approved For Release 1999/09/21 : CIA-RDP79T00935A000100100001-2

j. Port of Lagos.

(1) Carter Bridge — 1,800-foot bridge between Lagos Island and Iddo Island, carries highway traffic.
(2) Denton Causeway — 750-foot causeway between Iddo Island and the mainland, carries rail and highway traffic.
(3) Thermoelectric power plant on Iddo Island — capacity 1[illegible],750 kw.
(4) Rail sidings on Iddo Island and at Apapa.
(5) 11 electric cranes, capacities up to 25 tons.
(6) 4 steam cranes.
(7) 2 floating cranes.
(8) Mobile cranes and lift buckets.
(9) Fuel oil and diesel fuel storage facilities.
(10) Water tanker and pipes to ships.
(11) Slipways of 60-, 120-, and 400-ton capacity.
(12) Floating drydock with lifting capacity of 3,600 tons.
(13) Two coal transporters on Iddo Island, Ijora Coal Wharf.

k. Port Harcourt.

(1) Rail sidings.
(2) Mobile cranes — 3-ton capacity.
(3) Storage facilities for diesel fuel and fuel oil.
(4) Bulk-storage oil plant and tanker pipelines.
(5) Coal docks.

Approved For Release 1999/09/21 : CIA-RDP79T00935A000100100001-2

Approved For Release 1999/09/21 : CIA-RDP79T00935A000100100001-2

2. Present Status of Local Measures to Protect Vulnerable Facilities.

The possibility of a major interruption to production of tantalite and columbite in Nigeria through sabotage of the rather primitive and scattered physical facilities is practically nonexistent. Although individual shipments of concentrates might be destroyed, such shipments are small and would therefore not represent a major loss of production over a period of time.

3. Security Comment.*

a. Conclusions.

(1) The probability of material disruption of production through sabotage to physical facilities at the mine sites in Nigeria is remote.

(2) Because of the widely dispersed locations and the diverse nature of the facilities involved in the production and shipment of tantalite and columbite, a detailed security program designed to provide safeguards against the numerous possibilities of sabotage is impracticable.

b. Recommendations.

Implementation of a security program sufficiently comprehensive to embrace all facilities is not justified under present conditions. However, the Nigerian authorities should be prepared to employ appropriate security measures if and when a security program is warranted.

* This section, dealing with security, has been prepared by the CIA component responsible for security matters.

Approved For Release 1999/09/21 : CIA-RDP79T00935A000100100001-2

Approved For Release 1999/09/21 : CIA-RDP79T00935A000100100001-2

APPENDIX

a. Selected Maps.

(1) Nigeria — Principal Mineral Deposits; 1:5,000,000; Office of Economic Warfare; 1943; CIA (OEC) 1057.
(2) Lagos Harbor; 1:12,000; US Navy Hydrographic Office; May 1939; corrected to May 1948; H.O. 2264.
(3) Nigeria; 1:500,000; Land and Survey Department, Lagos, Nigeria; Second edition (Military), 1942; CIA Call No. 3922. Sheets No. 3, 5, 6, 7, 9, 10, and 14.
(4) Nigeria; 1:2,000,000; Office of Strategic Services; 1944; CIA 2306.
(5) Sketch Map — Kabba Tantalite Field, Plan No. 1; 1:125,000; CIA Call No. 35972.
(6) Eri Tantalite Field, Plan No. 2; 1:62;500; CIA Call No. 35972.

b. Photographs Available in CIA Graphics Register.

(1) Nigerian Railway; 60 miles north of Lagos; OSS 969984.
(2) Jetty and Crane; Calabar; 1939; OSS 969999.
(3) Bako River Highway Bridge; 10 miles east of Bida; 1925; OSS 969981.
(4) Benue Bridge; Makurdi; OSS 970033.
(5) Mada River Bridge; Nassarawa; OSS 50918.
(6) Port Harcourt; 20 miles from mouth of Bonny River; 1925; OSS 969989.
(7) Open Pit Mining Operation; Enclosure to OO-B-26290; January 1941; Four photos.

Approved For Release 1999/09/21 : CIA-RDP79T00935A000100100001-2